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Comments

Please find attached an Amendment to the Claims for the pending application:

No. 10/661,465, Applicants, Vitaliano, et al; Russell S. Negin,  
Examiner, Art Unit 1631

Filed Pro Se



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April 4, 2006

Commissioner of Patents  
Alexandria, VA 22313-1450

Re: Amendment of Claims


This is an Amendment to the Claims for the pending application:

No. 10/660,465  
Applicants, Franco Vitaliano & Gordana Vitaliano  
Russell S. Negin, Examiner,  
Art Unit 1631

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PATENT APPLICATION No. 10/661,465  
Applicants: Franco Vitaliano and Gordana Vitaliano  
Amendments to the Claims  
April 4, 2006

Claims

- 1 1. (Original): A quantum information processing element comprising  
2 a cage defining a cavity formed from a plurality of self-assembling protein molecules,  
3 and  
4 one or more cargo elements located within the cavity, wherein at least one of the cargo  
5 elements comprises a qubit programmable into a plurality of logical states.
- 1 2. (Original): A quantum information processing element according to claim 1, comprising  
2 receptors for capturing and positioning one or more cargo elements within the cavity.
- 1 3. (Original): A quantum information processing element according to claim 2, comprising  
2 a vesicle located within the cage and enclosing one or more cargo elements, wherein the  
3 receptors extend through the vesicle to capture and position a cargo element within the vesicle.
- 1 4. (Original): A quantum information processing element according to claim 3, comprising  
2 adaptors disposed between the receptors and the cage and binding to the receptors.
- 1 5. (Original): A quantum information processing element according to claim 1, comprising  
2 a vesicle located within the cage and enclosing the one or more cargo elements.
- 1 6. (Original): A quantum information processing element according to claim 1, comprising  
2 molecular tethers for capturing and positioning one or more cargo elements within the cavity.
- 1 7. (Original): A quantum information processing element according to claim 1, comprising  
2 direct cage bonding for capturing and positioning one or more cargo elements within the  
3 cavity.
- 1 8. (New): A quantum information processing element according to claim 1, comprising  
2 a functionalized cage for attaching one or more elements externally to the cage.
- 1 9. (Original): A quantum information processing element according to claim 1, comprising  
2 receptors, molecular tethers and direct cage bonding for capturing and positioning one or more  
3 cargo elements within the cavity.
- 1 10. (Original): A quantum information processing element according to claim 1, comprising  
2 one or more cargo elements forming a non-permeable cavity.

- 1 11. (Original): A quantum information processing element according to claim 3, comprising  
2 a vesicle forming a non-permeable cavity.
- 1 12. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling cage that is electrically neutral and inhibits charge transfer between the cage  
3 and its enclosed cargo elements.
- 1 13. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling cage that reduces the tendency of a plurality of logical states in a coherent state  
3 to collapse into a decoherent state.
- 1 14. (Original): A quantum information processing element according to claim 1, comprising  
2 a non-qubit-only cage that inhibits non-quantum information processing cargo elements from  
3 interfering with qubit cargo element operation in other cages.
- 1 15. (Original): A quantum information processing element according to claim 3, comprising  
2 a self-assembling vesicle that is electrically neutral and inhibits charge transfer between the  
3 vesicle and its enclosed cargo elements.
- 1 16. (Original): A quantum information processing element according to claim 3, comprising  
2 a self-assembling insulative vesicle that reduces the tendency of a plurality of logical states in a  
3 coherent state to collapse into a decoherent state.
- 1 17. (Original): A quantum information processing element according to claim 4, comprising  
2 self-assembling receptors and adaptors that are electrically neutral and inhibit charge transfer  
3 between the vesicle and cage and their enclosed cargo elements.
- 1 18. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling cage that reduces contaminant background radiation to cargo carried within the  
3 cage.
- 1 19. (Original): A quantum information processing element according to claim 3, comprising  
2 a self-assembling vesicle that reduces contaminant background radiation to cargo carried within  
3 the vesicle.
- 1 20. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling framework of cages to structurally support one or more self-assembling QIP  
3 elements.

- 1 21. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling electrically neutral substrate of cages to structurally support one or more self-  
3 assembling QIP elements.
- 1 22. (Original): A quantum information processing element according to claim 1, comprising  
2 a self-assembling framework of cages to structurally order one or more self-aligning QIP  
3 elements.
- 1 23. (Original): A quantum information processing element according to claim 1, wherein a  
2 cage is empty and includes no cargo elements.
- 1 24. (Original): A quantum information processing element according to claim 1, wherein the  
2 one or more cargo elements is a single cargo element comprising a qubit programmable into a  
3 plurality of logical states.
- 1 25. (Original): A quantum information processing element according to claim 1, wherein the  
2 one or more cargo elements are a plurality of cargo elements.
- 1 26. (Original): A quantum information processing element according to claim 24, wherein  
2 the plurality of cargo elements are qubits programmable into a plurality of logical states.
- 1 27. (Original): A quantum information processing element according to claim 24, wherein at  
2 least some of the plurality of cargo elements are quantum information processing cargo elements
- 1 28. (Original): A quantum information processing element according to claim 24, wherein at  
2 least some of the plurality of cargo elements are non-quantum information processing cargo  
3 elements.
- 1 29. (Currently amended): A quantum information processing element according to claim 1,  
2 wherein the cargo elements respond to stimuli internal and or external to the cage.
- 1 30. (Currently amended): A quantum information processing element according to claim 3,  
2 wherein a vesicle and its contained cargo elements respond to stimuli internal and or external to  
3 the vesicle.
- 1 31. (Currently amended): A quantum information processing element according to claim 24,  
2 wherein a subset of the non-quantum information processing cargo elements include one or more  
3 therapeutic single task and or multitask in vivo and or in vitro agents.
- 1 32. (Cancelled):
- 1 33. (Cancelled):
- 1 34. (Cancelled):

- 1 35. (Original): A quantum information processing element according to claim 24, wherein a  
2 subset of qubit and non-quantum information processing cargo elements include one or more  
3 quantum dots.
- 1 36. (Original): A quantum information processing element according to claim 24, wherein a  
2 subset of the cargo elements include one or more photonic dots.
- 1 37. (Original): A quantum information processing element according to claim 24, wherein a  
2 subset of the cargo elements include one or more liquids without dopants or with one or more  
3 dopants of any suitable type.
- 1 38. (Original): A quantum information processing element according to claim 24, wherein a  
2 subset of the cargo elements include a gas or vapor without dopants or with one or more dopants  
3 of any suitable type.
- 1 39. (Original): A quantum information processing element according to claim 1, wherein one  
2 or more qubit cargo elements are programmed by one or more pulses of electromagnetic  
3 radiation.
- 1 40. (Cancelled):
- 1 41. (Cancelled):
- 1 42. (Cancelled):
- 1 43. (Currently amended): A quantum information processing element according to claim 1,  
2 wherein the qubit ~~includes an unpaired electron~~ and the plurality of logical states of the qubit are  
3 defined by ~~electron~~ one or more spin polarization properties and or attributes.
- 1 44. (Cancelled):
- 1 45. (Cancelled):
- 1 46. (Currently amended): A quantum information processing element according to claim 1,  
2 wherein the qubit includes ~~a nitroxide molecule~~ one or more species of molecules.
- 1 47. (Cancelled)
- 1 48. (Original): A quantum information processing element according to claim 1, wherein the  
2 qubit is photon-based and the plurality of logical states of the photon-based qubit include a  
3 coherent logical state.
- 1 49. (Original): A quantum information processing element according to claim 1, wherein the  
2 plurality of logical states includes a coherent state.

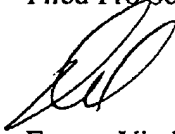
- 1 50. (Original): A quantum information processing element according to claim 1, wherein the  
2 plurality of logical states includes a coherent state at room temperature.
- 1 51. (Original): A quantum information processing element according to claim 1, wherein the  
2 self-assembling protein molecule is a clathrin molecule.
- 1 52. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage comprises self-assembling synthetic protein molecules.
- 1 53. (Currently amended): A quantum information processing element according to claim 4,  
2 wherein receptors, adaptors, and vesicle comprise natural and or synthetic protein molecules.
- 1 54. (Currently amended): A quantum information processing element according to claim 1,  
2 comprising a ~~metallie~~ coating of one or more materials on part or the entirety of the cage.
- 1 55. (Currently amended): A quantum information processing element according to claim 4,  
2 comprising a ~~metallie~~ coating of one or more materials on a portion or an entirety of the  
3 receptors, adaptors, and vesicle.
- 1 56. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage is substantially greater than one nanometer in diameter.
- 1 57. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage is at least about 50 nanometers in diameter.
- 1 58. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage is at least about 100 nanometers in diameter.
- 1 59. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage is symmetric with respect to a plane.
- 1 60. (Original): A quantum information processing element according to claim 1, wherein the  
2 cage has icosahedral geometry.
- 1 61. (Original): A quantum information processing element according to claim 1, wherein  
2 qubits are linearly positioned at vertices along a single plane using circulant ordering.
- 1 62. (Original): A quantum information processing element according to claim 1, wherein  
2 multiple quantum information processing elements are physically linked together.
- 1 63. (Currently amended): A quantum information processing element according to claim 1,  
2 wherein multiple self-assembling QIP elements are functionally linked together, either locally  
3 and or at a distance.

1 64. (Currently amended): A quantum information processing element according to claim 1,  
2 wherein the quantum information processing element forms a hybrid system upon its physical  
3 and or functional integration with non-invention elements in vitro and or in vivo.

1 65. (Original): A method for forming a quantum information processing element comprising  
2 forming from self-assembling protein molecules a cage defining a cavity, and locating  
3 one or more cargo elements within the cavity, wherein  
4 at least one of the cargo elements comprises a qubit programmable into a plurality of  
5 logical states.

1  
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3 Filed Pro Se

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